WQB "Wide Aperture Quad" for Main Injector

27 October 2005, 9:00 AM
IB#2 conference room

Attendees: Linda Alsip, Jamie Blowers, Bruce Brown, Weiren Chou, TJ Gardner, Hank Glass, Vladimir Kashikhin, Bill Robotham

Measurements

Hank reported that data has been gathered (stretched wire, harmonics and off-axis harmonics) from WQB002 but has not yet been processed. Hank will report the results in next weeks' meeting.

Weiren brought up a question regarding 'reset current' and hysteresis, wanting to compare WQB data with IQB data. It was stated that only one IQB magnet had a hysteresis study done, and that it was not evident that doing another IQB magnet would be of any help (or at least it would take a large amount of effort to make the data useful). It was determined that the measurements from the one IQB on this topic would have to suffice.

Bruce presented a verbal description of his recent study on the end versus body saturation effects. He concluded that the body saturation is as expected, and is the predominant effect compared to the end saturation, which is present but negligible. Vladimir stated that the end saturation is of second order, and so agreed that it is negligible.

Vladimir showed some calculations of integrated gradient data comparing WQB with IQB. He wondered why we don't adjust the length to provide a closer match of trim coil currents at higher main coil currents. Weiren and Bruce responded that this is the trade-off for wanting better matching at lower currents, and so this is the best we can do based on what we know right now.

Design issues

Weiren desired to verify whether the pole piece angle cut was truly the optimized angle and depth. Bruce and Vladimir both expressed assurances that any change would provide negligible improvement ((sic) second order). Bill verified that the removable pole piece extends beyond the iron by only ~.005". Again it was concluded that we do not need to change the shape of the pole end pieces. The magnet integrated strength had already been declared fixed.

Fabrication

WQB001 is back in IB2 for its beam tube flanges, manifold protection, and final inspection.

WQB002 is in IB1 and will be the subject of the trim coil measurements. It needs the same finishing touches as WQB001.

WQB003 is in IB1 and needs the same finishing touches as WQB001.

WQB004 is still in IB2 waiting for the same finishing touches as WQB001.

WQB005 is welded up and being manifolded.

WQB006 is being assembled.

WQB007 has all main coils, 3 trim coils and 3 cores stacked.

WQB008 has all main coils wound. Stacking of cores for both 008 and 009 will be interrupted to stack spare p-bar pulsed magnet cores. Then we will retool to complete WQB core stacking.

WQB009 has one main coil wound.

Now that the end has been settled, we can start buttoning up the magnets. After the magnet and the fabrication paperwork are complete, each magnet will go to MTF for a production measurement set. Although the data has already been taken on WQB001, having a set clearly identified as the production data will be very convenient.

Schedule

TD is aiming to have seven magnets fabricated and measured by the end of December. WQB008 and 009 will be ready mid January to allow the review of data and selection of the best seven for installation.

Next meeting will be Thursday, 3 November 2005, at 9:00 in the Industrial Building 2 conference room.